

# Video: Hail simulations give crops a beating

Researchers studying how hail-damaged crops respond to fungicides and other inputs

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Hail has damaged the crop. Now what?

Will it recover? Will it be more susceptible to disease? Will spraying fungicide give a yield boost?

Ken Coles of Farming Smarter, an applied research organization, said he has often heard such questions from farmers, but they aren't easy to answer.

Hail is fickle. It's unpredictable, uneven and unloved. In a research setting, replication is a challenge.

But as it turns out, a dog chain and a lot of elbow grease will produce a reasonable facsimile to in-crop hail damage.

Current research involves beating crops with a chain, by hand and with chain appendages on a tractor.

Coles demonstrated hail simulation and resulting crop damage at the Farming Smarter field school in Lethbridge June 23-25.

Various levels of damage have been inflicted on favabeans, dry beans, peas, wheat and canola to see how they recover and how they respond to post-hail fungicide applications.

Hail is never welcome, unless the crop is already so bad that hail insurance might bring the only profit.

However, Coles said the human response to hail can result in money wasted on rescue attempts.

“It's almost like an emotional thing, too, that encourages people to want to do something. Sort of that Florence Nightingale effect,” he said.

“You’ve got these crops that you’ve invested in and some big, mean old white cloud comes and beats it up, so now what do you do? Can you help it?”

Bruised leaves and broken stems laid waste by hail can make crops more vulnerable to subsequent problems.

“There are opportunistic pathogens that may take advantage of that, so in that sense, it’s pretty easy to go to the next step and say, ‘maybe spraying a fungicide is worthwhile.’ The problem is, how do we actually study that?”

That’s where plant pathologist Ralph Lange enters the picture.



*Ken Coles of Farming Smarter jerks the dog chain used to simulate in-crop hail damage during a field school in Lethbridge. | Barb Glen photo*

The researcher with Alberta Innovates has been experimenting with hail simulation for several years after being approached by the Agriculture Financial Services Corp. to update the 20-year-old hail table used for crop insurance purposes.

“Problem No. 1 is how do you simulate hail,” said Lange.

He and his crew first tried flinging pea gravel onto the crop from the back of a grain truck, but it didn’t inflict damage equivalent to a hailstorm and there was a human cost.

“If you try that for any length of time, you really get rotator cuff injuries,” he said.

A slow-moving flail mower was the next idea, but it inflicted too much damage, in addition to flinging parts of plants around in a way that hailstorms do not.

Finally, Lange and his crew tested a simple hand-held dog chain.

“We don’t actually need to have things flying through the air and hitting it. We just need to replicate the damage,” said Lange.

“We feel that we can now create damage ... by basically hitting the plants with a chain.”

With that method now in place, Coles said the next three years of the study will examine hail-damaged crop response to fungicide, micronutrient blends, plant growth promotants and growth regulators.

Alberta Pulse Growers provided funding this year.

Anecdotally, peas in particular are reported to respond well to post-hail fungicides. Research will test that.

Lange has already conducted research on post-hail canola response to disease.

He is an expert on blackleg in canola, but despite using dog chains and snipping stems of canola to simulate hail, he was unable to get blackleg lesions to form in his canola test plots last year. Deliberately seeded sclerotinia was similarly unco-operative.

However, those plots represent only one year at one site, so more research is needed. That said, he has one observation.

“At least some of the time, just having hail does not necessarily mean that you have those diseases in there. Do I think that, at least on canola, that the hail made the blackleg worse? And my feeling is ... the answer probably is no.”

Lange said he has heard anecdotal reports that fungicide applications to canola after hail increase yields.

The most likely explanation is that the fungicides killed whatever minor levels of fungi were already in the crop, resulting in a yield response.

However, tests of that theory are also part of planned research.

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